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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,496	06/30/2003	Dennis M. Pfister	P-6948	3343

24209 7590 07/19/2006

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EXAMINER
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WU, IVES J

ART UNIT	PAPER NUMBER
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1724

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/611,496

Applicant(s)

PFISTER ET AL.

Examiner

Duane S. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,6-10,12-15,17,18,20-24,26,27,29,34-38,40,45 and 46 is/are rejected.
- 7) ☒ Claim(s) 2-5,11,16,19,25,28,30-33,39 and 41-44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

The previous indication of allowed claims has been withdrawn and vacated. A new action on the merits follows.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,6-10,12-15,17-18,20-24,26-27,29,34-38, 40,45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarkkinen(US Patent No. 4,737,164) in view of Lagasse(US Patent 5,902,562).

The claims are directed to the apparatus (claims 1, 12, and 21) and process (claim 40) for separating a first gas from a mixture of first gas and at least a second gas, the apparatus comprising a housing having an inlet port, an outlet port, and an adsorbent, positioned in said housing, comprising a carbon based foam monolith with an affinity for the first gas, wherein the method of separation comprises flowing the gas mixture over or through the adsorbent in the housing, adsorbing the first gas onto the adsorbent, stopping the flow of gas mixture when the adsorbent bed is near saturation, and desorbing the first gas from the adsorbent. Sarkkinen (4.737,164) teaches the apparatus for removing gaseous inorganic and organic impurities, such as volatile materials (first gas), from a mixture with at least a second gas. See abstract, and claim 1 in Sarkkinen. The apparatus (see Figure) comprises a housing (12), an inlet port (1), an outlet port (5) and carbon-based adsorbent beds (3). After the first gas (volatile organic contaminants) has been adsorbed to near saturation in the adsorbent bed (3),

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the adsorbent is regenerated by first heating the adsorbent bed by applying heat by means of electric heating elements fitted therein or electrical nonthermal means and/or thereafter conducting a flow of inert gas via inlet conduit (14). See col. 3, lines 7 – 25. Previously adsorbed gas is desorbed during the regeneration process. Although Sarkkinen apparatus has a partition (17) in the housing (12), and adsorbents made of fibrous activated carbon, all the essential elements of applicant's apparatus (housing, inlet port, outlet port and adsorbent in housing) are taught by Sarkkinen, except for the nature of the carbon-based adsorbent bed in the housing. It is submitted that Sarkkinen separates the first gas from a mixture of first and at least second gas in the same manner (method) as now claimed by the applicant, except for the nature of the carbon-based adsorbent bed in the housing. Sarkkinen does not teach that the adsorbent bed should comprise a "carbon based foam monolith", as required by applicant's claims. However, the cylindrical nature of the fibrous activated carbon adsorbent beds in Sarkkinen leaves a lot of volume unoccupied in the housing, thus increasing the void volume. Lagasse (5,902,562) teaches the carbon-based monolithic adsorbent (see summary) that is useful "as media for separating and purifying liquids and gases, and for recovery and storage of gases" (col. 4, lines 16-26). Lagasse recognizes that for "separation processes ... the efficiency ... is reduced by large interstitial spaces" in the adsorbent (col. 1, lines 26-34). Lagasse overcomes this disadvantage by developing "carbon materials in the form of a continuous, monolithic structure and prepared in such a way so as to possess the desirable properties of high surface area" (col. 1, lines 51-55 and col. 2, lines 61-66). Therefore, it would have been obvious to one of ordinary skill in

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the art to substitute the fibrous carbon-based adsorbent bed (having high interstitial void volume) in Sarkkinen housing (12) and replace with the continuous monolithic structure (same as applicant's "carbon based foam monolith") of Lagasse, which monolithic structure with high macropore volume associated with high permeability for the fluids and high surface area would have been expected to perform the same function as the Sarkkinen adsorbent bed (3), and obviously more efficiently, as taught by Lagasse. In view of specific advantages of the carbon based foam monolith (continuous monolithic structure) in the separation and purification of gases, as taught by Lagasse, one of ordinary skill in the art would have been motivated to replace the adsorbent beds (3) in the housing in the apparatus of Sirkkinen comprising an inlet port, an outlet port and the adsorbent which is positioned in the housing in the same manner, and practice the method of separation by flowing the gas mixture through the adsorbent monolith, preferentially adsorbing one (first) gas in the mixture, stopping the flow when the bed is saturated, and later desorbing the first gas from the adsorbent bed.

Claims 2-5,11,16,19,25,28,30-33,39,41-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: None of the prior art of record teach nor suggest the claimed subject matter of claims 2-5,11,16,19,25,28,30-33,39,41-44 in combination with the features of the independent claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duane S. Smith whose telephone number is 571-272-1166. The examiner can normally be reached on 8:30-6:00 M-TH.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane S. Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Duane S. Smith  
Primary Examiner  
Art Unit 1724

  
7-17-06

Dss  
7-17-06